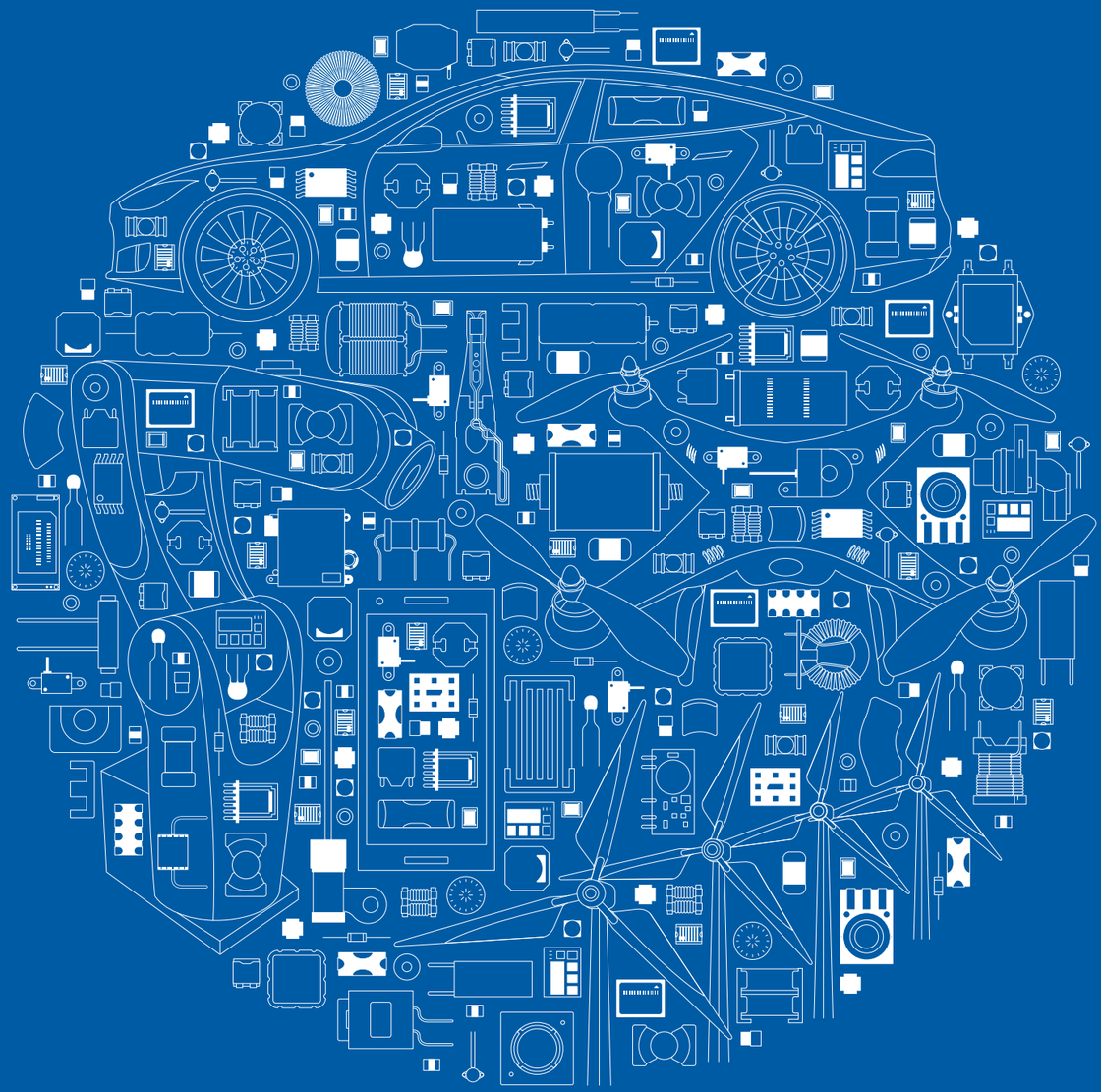
Attracting Tomorrow



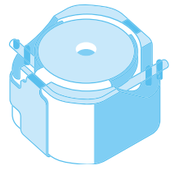
TDK Company Profile

TDK Corporation
3-9-1, Shibaura, Minato-ku, Tokyo, 108-0023, Japan
http://www.global.tdk.com/

TDK—All around you, and in your future

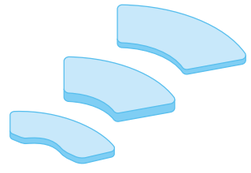
The rapid spread of smartphones and the evolution of products such as personal computers, electrical appliances, automobiles, and industrial equipment are making our daily lives ever more convenient and enjoyable.
TDK continues to play a large role in this electronic revolution.
By coming up with new ideas and developing the technologies to realize them, we are aiming to contribute to human society on a global level. Although often unseen, our products are all around you, now and even more so in future. TDK—a name that stands for electronic components.

Main Business Segments



Passive Components

As well as active components, such as semiconductor chips, passive components like capacitors, inductors, high-frequency components, and sensors are essential to electronic equipment. By turning passive components into chips and integrating them into modules, TDK helps to make electronic products more compact and powerful.



Magnetic Application Products

TDK is harnessing its expertise in magnetic materials and magnetic circuit technology to significantly increase power savings in electrical appliances and automobiles. Solutions include high-efficiency power supplies, various kinds of high-performance magnets, and magnetic heads for hard disk drives (HDDs).

Film Application Products

We supply lithium polymer batteries for many different types of small electronic devices, including smartphones. And because of the high energy density of TDK batteries, these solutions will play a transformative role in the reach and efficacy of next generation products, including solar and wind power applications.

Contributing to the future of electronics and the progress of society by bringing products of value to growth markets

TDK was established in 1935 as a venture business born out of academic research. The goal: to develop the world's first commercialization of the magnetic material "ferrite." Ferrite had been invented at the Tokyo Institute of Technology, but its possibilities were as yet unknown. TDK was driven by a belief in its potential and a desire to create something unprecedented that would change the world. This dream has been realized and as the electronics industry continues to grow in size and influence, TDK will continue to be an important agent of change.

Throughout the eight decades since the company's founding, and bolstered by our strong foundation in magnetics technology derived from ferrite, TDK has been steadfastly pursuing the development of products that have true value. Keeping alive the venture spirit that defined our beginnings, we have taken up the challenge of exploring new technologies while maintaining a strong dedication to craftsmanship as embodied in the Japanese *Monozukuri* concept— a dedication to quality and a new era of electronic craftsmanship. This enabled us to create an ongoing succession of innovative and valuable products. Today, TDK's product portfolio comprises ferrite cores, coils, transformers, ceramic capacitors, sensors, magnetic heads, magnets, power supplies, batteries and many other electronic components and devices.

The age of the truly smart society where people's lives and the world of industry are sustained by extremely sophisticated networks is about to begin. In order to help build these new social frameworks, TDK is focusing on ICT (Information and Communication Technology), automotive, as well as the industrial equipment and energy sectors. At the same time, we are entering the wearables and healthcare markets, aimed at supporting a healthy, satisfying and productive lifestyle. Sensors and actuators, energy units, and next-generation electronic components are important for this segment and will be the focus of our expansion efforts.

The strength and reach of TDK's global network, which links more than 30 countries and regions around the globe, will speed up the development and marketing of innovative products.

Shigenao Ishiguro
President & CEO
TDK Corporation

Shigenao ISHIGURO

Corporate Motto

Contribute to culture and industry through creativity

Corporate Principle

"Vision" "Courage" "Trust"

Four great world-class innovations by TDK

Innovation

01

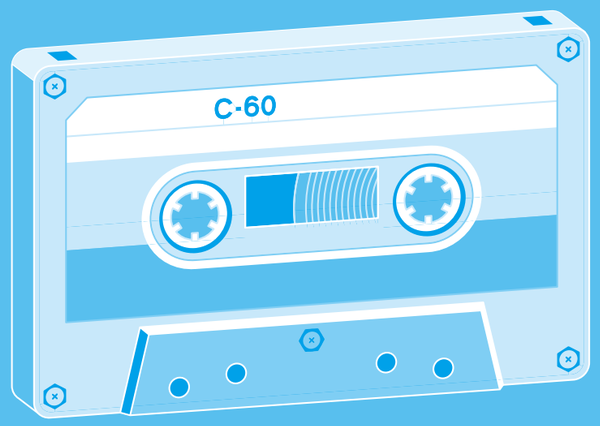
1935

Invention of a revolutionary magnetic material for electronics called ferrite

The magnetic material ferrite was invented by Dr. Yogoro Kato and Dr. Takeshi Takei. The company that became TDK was founded with the aim of realizing the industrial potential of this material, successfully creating the world's first ferrite core product. The birth of a new material marked the beginning of a dramatic evolution in electric and electronic technology on a worldwide scale. At the time, the radio was an important source of information for people, but reception was often plagued by problems such as noise and interference. The new technology based on ferrite enabled much better reception with clearer voice quality. Ferrite cores also proved highly useful in other areas such as television and the telephone, leading to a drastic improvement in performance and productivity. The rapid spread of better products made people's lives more pleasant and convenient.

Innovation

02



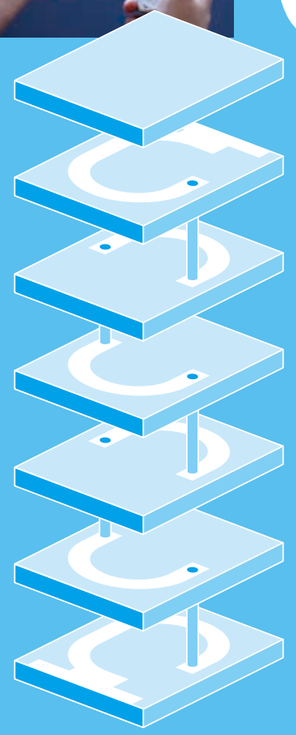
1968

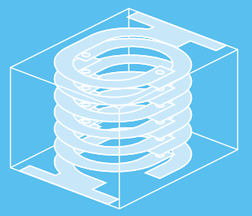
The world's first cassette tape designed for music revolutionizes music enjoyment

The 1960s saw the birth of a standard for encapsulating magnetic recording tape in a cassette shell (C cassette). Building on this development, TDK developed the world's first cassette tape designed specifically for music. The compact and handy cassette took the world by storm as a convenient recording medium for music as well as the spoken word. The introduction of easily portable cassette tape players created a new lifestyle, allowing young people to take their favorite music anywhere for enjoyment at any time. TDK proceeded to introduce a succession of high-performance cassette tapes that made the TDK name a household word around the world.

Innovation

03





1980

Super-advanced multilayering technology breaks the barriers of small dimensions and high performance

As electronic devices kept shrinking in size and weight, the inductors (coils) that form an indispensable part of a myriad of circuits also needed to become much smaller. Rising to the challenge, TDK pioneered the development of multilayer chip inductors in 1980. An epoch-making idea called fine multilayering technology involves printing the pattern of internal electrodes on a sheet of ferrite or the like with metal paste and stacking these alternately on two sides. The notebook computers as well as small video cameras, mobile phones and many other electronic devices that have flourished since the 80s would not have been possible without this technology.

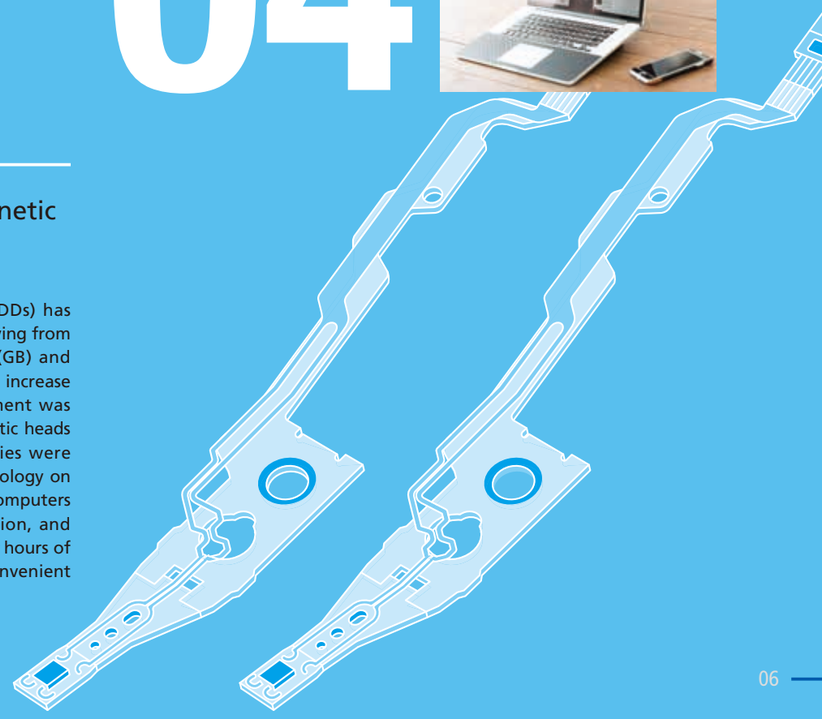
Innovation

04

1987

Development of thin-film magnetic heads enables amazingly high recording density

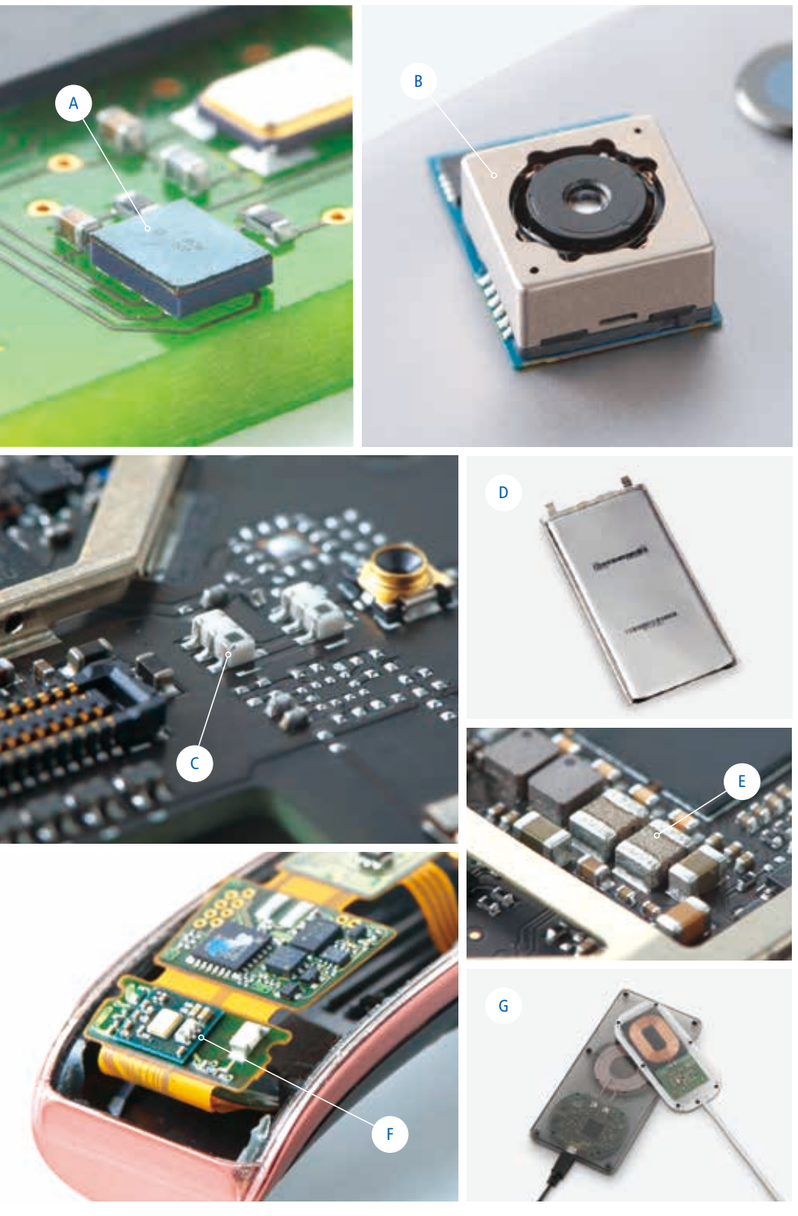
The storage capacity of hard disk drives (HDDs) has grown dramatically over the past 20 years, moving from the order of megabytes (MB) to gigabytes (GB) and now to terabytes (TB), each step involving an increase by a factor of 1,000. This amazing achievement was made possible by TDK technology. The magnetic heads that allow extremely high recording densities were developed by applying thin-film process technology on the nanometer level. As a result, notebook computers can hold much greater volumes of information, and home-use HDD recorders can easily store many hours of high-definition video programs, ready for convenient viewing at any time.



Moving toward 2020: The next-generation mobile communication systems

Smartphones have become society's mobile computers of choice, allowing people around the globe to be more productive and connected. These sophisticated information tools form a social infrastructure that enhances the relationships of people no matter where they are— in homes, cars, and factories. This trend is further boosted by the advent of ultra-high speed, large-capacity communication standards such as 4G, LTE, and 5G.

TDK products play an important role in the realization of these new network technologies. Our wide variety of electronic components and modules make full use of advanced core technologies and dramatically expand the possibilities of the smartphone as we move toward the implementation of 5G in 2020.



Becoming even smarter

The capabilities of smartphones continue to evolve. TDK sensors and actuators set the groundwork for this growth toward higher mobile intelligence.

A Sensors/ MEMS microphones, Atmospheric pressure sensors

Sophisticated MEMS (Micro Electro Mechanical Systems) technology supports the creation of microphones with excellent performance, atmospheric pressure sensors that supply highly accurate position information, and other advanced capabilities.

B Lens actuators for camera modules

Compact actuators realize high-speed auto-focus and image stabilizing functions for cameras integrated in smartphones and other devices.

More convenient and engaging communication

Advanced high-frequency components and modules offered by TDK improve high-frequency range performance and turn smartphones into better communicators.

C High frequency components/ Diplexer, Balun

The TDK portfolio consists of high-frequency components that are indispensable for the send/receive systems of smartphones. Especially important are "diplexers" used in the antenna input/output circuitry to either mix or divide two frequencies, and "baluns" used to handle balanced/unbalanced changeover and impedance conversion.

Delivering the ultra-high speed/ large-capacity network society

Making smartphone batteries last longer

The more advanced the functionality of a mobile device, the more important battery life becomes. By developing high-capacity lithium polymer batteries, power inductors, and related parts, TDK makes smartphones last longer and consume less power.

D Lithium polymer batteries

This type of rechargeable battery is widely used in smartphones and other mobile devices. It provides excellent performance and is ideal for low-profile designs.

E TFM series of thin-film power inductors

The power supply circuitry of smartphones and similar devices requires highly compact power inductors for improved power conversion efficiency.

High density component mounting that transcends conventional thinking

TDK leads the charge in the realization of amazingly thin and compact smartphones. Going far beyond simply mounting components on a substrate, TDK has succeeded in creating a method for embedding components in the actual substrate, resulting in much higher mounting density.

F Semiconductor Embedded Substrate (SESUB)

TDK's SESUB technology allows embedding integrated circuit chips directly in the resin substrate. A SESUB module with a three-dimensional arrangement of components offers enormous space saving advantages while realizing high performance.

Others

G Wireless power transfer coils

The future of mobile device charging is wireless. TDK's sending and receiving coil units are compatible with various wireless power transfer standards, so charging can be performed by simply placing a handheld device in a cradle. No wired connection is necessary.

Aiming for zero traffic accidents and making autonomous driving a reality

The world of car electronics keeps climbing to new levels of safety, comfort, and environmental compatibility. Limiting the volume of exhaust gas from automobiles is the key to solving the serious problem of carbon dioxide emissions. This necessitates the rapid development and introduction of new vehicle configurations known collectively as xEV (HEV/PHEV/BEV). In addition, the "connected car" that is constantly linked to the internet, will enable the realization of advanced driver assistance systems (ADAS) and autonomous driving to further improve safety, accuracy and comfort. TDK provides a wide range of electronic components and devices that support the electrification of automobiles. TDK's outstanding reliability meets the severe demands of the automotive environment while reducing environmental impact.

Better fuel economy conserves energy

For xEVs to become widely accepted, reduced fuel and electric power consumption are essential. TDK's compact, high-efficiency DC-DC converters and on-board chargers, as well as powerful neodymium magnets will make drive motors more efficient and contribute to energy-saving mobility.

A On-board chargers

TDK's industry's smallest class chargers are designed for high-capacity, high-efficiency charging of the main battery of a PHEV or BEV and are optimized to fulfill automotive-grade quality requirements.

B Automotive DC-DC converter for xEVs

The product down-converts the high voltage of the xEV's main battery to the level required by automotive electronic equipment. It is used by many xEV manufacturers both in Japan and overseas.

C Neodymium magnets

Powerful neodymium magnets contribute to reduced energy requirements and current consumption in xEV drive motors. The smaller size and lighter weight of the motors also contribute to higher efficiency and better fuel economy.

The ultimate safety goal — zero traffic accidents

ADAS are expected to eventually prevent accidents before they happen, leading to the "car that doesn't crash." TDK's versatile high-reliability electronic components contribute to the realization of this goal. TDK's high sensitivity magnetic sensors are also improving the safety of electric power steering (EPS) systems that efficiently and reliably guide the car.

D Magnetic sensors

TMR sensors (an application of HDD head technology) aid steering angle detection. They are also used as rotation sensors. Hall sensors made by TDK-Micronas provide accurate position data from the transmission and many other parts of the vehicle.

Supporting the safe and environment-friendly "connected car"

E High reliability electronic components / Common mode filters, Power inductors, Ceramic chip capacitors, Varistors, 3-terminal feed-through filters

As cars rely more on electric and electronic systems, noise emitted by automotive components has the potential of disrupting operation and causing serious and even fatal accidents. TDK produces noise countermeasure components and other highly dependable electronic components that ensure the safety of automotive LANs and electronic control units (ECUs).

Evolving into a fascinating "connected car"

ICT technology empowers a new age, intricately linking on-board automotive networks to outside networks. Various high-frequency components from TDK will play an even more important role in this scenario than before. And ever since keyless entry as well as one-push door locking and engine start systems came onto the scene, TDK transponder coils have been used extensively for these applications. TDK will continue to play a critical role in connecting automotive networks to the outside world.

F High frequency components

High-frequency components such as high-Q inductors, multilayer band-pass filters, and LTCC antennas for applications support telematics and car connectivity.

G 3D transponder coils

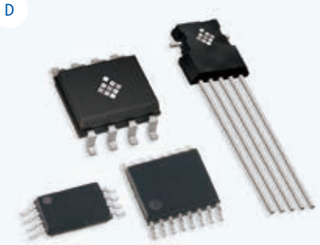
3D transponder coils combine high-sensitivity coils for three axes (X, Y, Z) in a single compact unit, enabling more convenient and reliable keyless entry systems.

A

B

C

D



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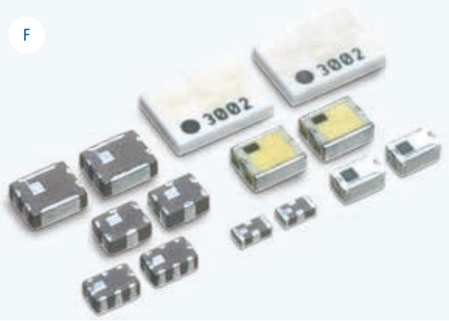


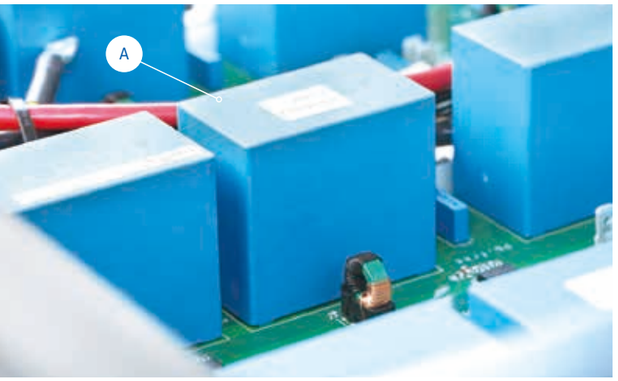
G

Contributing to clean cities

One of the key challenges for humankind in the 21st century will be to build a prosperous society, while reducing the adverse effects of carbon dioxide emissions. Renewable energy systems such as wind and solar power installations are important clean energy sources. In the industrial equipment and rail transport industries, TDK will contribute to efficient energy use through more compact and lighter designs resulting in higher efficiency and increased accuracy. TDK is harnessing its unique materials and processing technologies to provide essential devices to these sectors and contribute to a clean and smart global society.

Contributions to renewable energy

Wind and solar power installations are being increasingly used the world over as environment-friendly sources of renewable energy. In particular, large scale offshore wind farms are recently becoming a trend. TDK supplies power film capacitors and large neodymium magnets that boost the efficiency of wind power generation.



A Power film capacitors

These capacitors use various kinds of plastic film as the dielectric material. They are compact and characterized by high reliability and long service life, essential qualities for use in power conditioners and inverters for solar power generation systems.

B Neodymium magnets for wind power generation

TDK has developed large high-performance neodymium magnets designed for the rotors of gearless wind power generators. Highly sophisticated bonding technology enables the formation of specialized modules which are increasingly used also in high power installations for five megawatts and above.

C High-capacity lithium polymer batteries

These rechargeable batteries are characterized by high energy density. Their popularity is growing as a source of storage for solar or wind power generation systems.

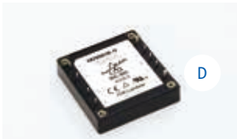
Toward a thoroughly energy-conscious society

Supporting higher efficiency in transportation infrastructures

Rail-based transportation is currently being reappraised worldwide for its energy efficiency and low carbon emissions. As with all transportation modes, railways require high levels of infrastructure reliability and safety. TDK's products meet these needs with rugged, high-efficiency converters, inverters, power modules, and similar products that meet the specification requirements of various countries.

D DC - DC converters

TDK produces industry standard brick sizes, for smaller dimensions, low profile, and high power density converters. The converters are highly shock and vibration resistant and ensure stable operation in rail vehicles.



E Power film capacitors

Because of the high electric power required in rail vehicles, capacitors tend to be quite large and heavy. Relying on advanced materials technology and thin-lm technology, TDK has successfully introduced smaller and lighter power film capacitors that provide excellent reliability.

Making industrial robots more sophisticated

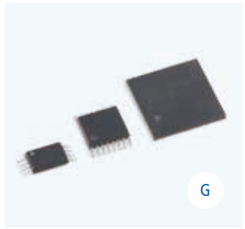
The use of robots in all areas of industry, including manufacturing and services, has increased dramatically over the last several years. TDK will continue to play an important role in increasing robot adoption by boosting the efficiency and accuracy of robots. TDK supplies magnets for electric motors and different types of sensors that make these robots smarter while reducing energy consumption.

F Neodymium magnets for motors

Electric motors are the "muscles" that enable robot movement. TDK's vast experience with magnetic materials gained through many years of experience enables us to produce highly efficient neodymium and ferrite magnets. This results in more compact and lightweight high-performance motors that help to conserve energy.

G TMR sensors

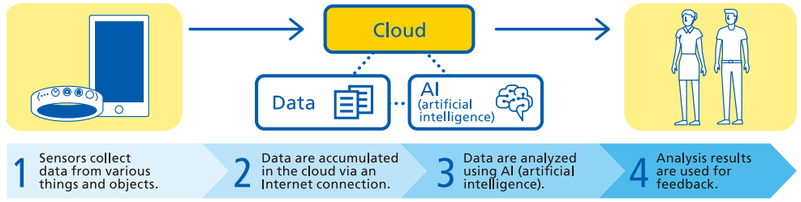
Multiaxial robots have many axes of movement, enabling complex operations that must be precisely controlled. This is where high accuracy sensors come in. TDK's high accuracy TMR sensors provide high output and high accuracy by applying TMR technology proven in the HDD heads sector. These are available as position sensors and in various other configurations that drive smart solutions in the industrial sector.



TDK: Connecting to the future

In 2035, TDK will celebrate the 100th anniversary of its foundation. At that time, the Internet of Things (IoT) will be in full swing, bringing about a host of changes both in the daily life of people and in business. Electronic components and devices from TDK will be an indispensable part of this future. Take a look at how some of the patterns that may emerge in 2035 relate to TDK products.

How the IoT works



With the IoT, all kinds of things are connected to the Internet, and data collected by sensors are stored in the cloud. AI systems with learning capability direct the accumulation of data and provide appropriate feedback. In all of these tasks, electronic components play a vital role.

01 Automotive

Comfortable traffic systems sustained by autonomous driving and wireless power transfer

All buses in the streets of the city are electric and drive themselves. Their batteries are charged by wireless power transfer points embedded in the roads at regular intervals. Cloud-based big data for traffic are analyzed with the help of AI and used to wirelessly send instructions to the buses to eliminate traffic jams.

▶ "Wireless power transfer" from TDK support such future possibilities.

02 Home

Two-way communication with the home

A wearable device that goes with its owner anywhere can control the air-conditioning, lighting, refrigerator, and other electrical systems in the house. Robots equipped with AI will be able to act as agents, providing advice about health and living conditions, and helping with all sorts of domestic chores.

▶ "SESUB" technology from TDK opens up such future possibilities.

03 Health Care

Life data sensing in daily life supports an active and healthy lifestyle

TDK sensors embedded in wearable devices perform life data sensing on a permanent basis. The information is then stored in data centers. When visiting a clinic, medical professionals can call up such data from a terminal to aid in establishing a diagnosis, determining underlying causes of illnesses, and provide guidance for a healthy life.

▶ "Sensors" ensors from TDK support such future possibilities.

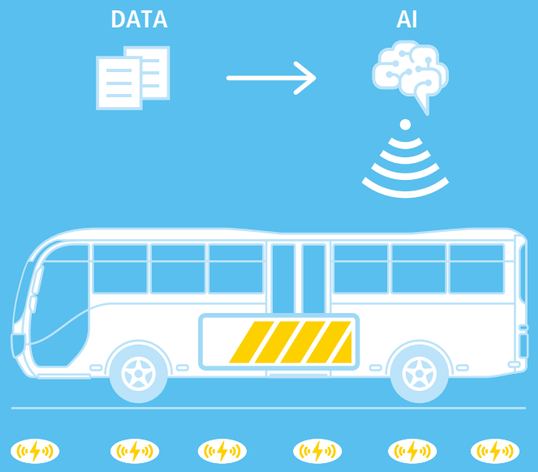
04 Energy

Distributing renewable energy with high efficiency using AI

Offshore wind farms are becoming more and more common. The high-performance magnets used in the generators of such systems produce electrical energy with high efficiency. AI is then used to optimize the distribution of power generated by offshore turbines and solar power installations to businesses and homes.

▶ "Magnets" from TDK support such future possibilities.

01 Automotive



Realizing ultimate motorization with capable power devices

The main focus of our current work is how to charge a stationary vehicle. The basic technology is already in place, and we are now at the stage where improvements in safety and versatility are being targeted. However, we are also looking toward the future, setting our sights on the charging of a moving vehicle. This eventually will lead to a solution that fundamentally overcomes the main drawbacks of electric vehicles, such as the time required for charging and the limited running distance. Of course, this will not be easy. In order to supply electricity in the brief moment that a vehicle passes over the coil, it is necessary to establish sophisticated elemental technology which does not yet exist, and a huge infrastructure with coils embedded in the road must be developed. The challenges are manifold, but the rewards will be nothing less than the ultimate motorization. We envision this as a world where electric vehicles combined with autonomous driving technology substantially solve environmental issues. Through an extended process of repeated trial and error, we intend to approach this goal step by step.

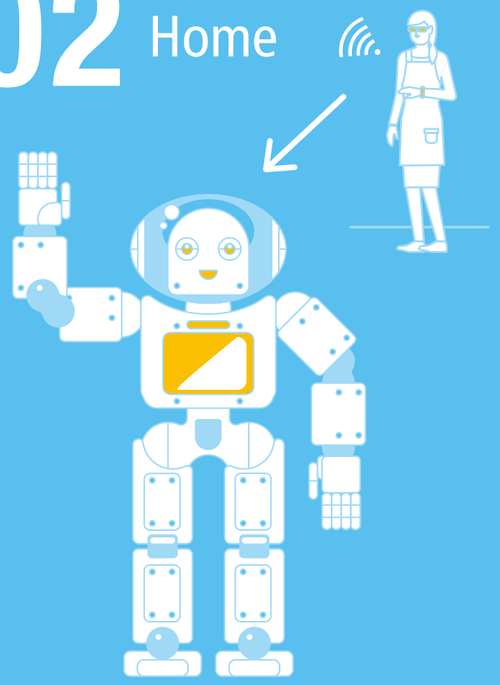
Masahide Ohnishi

Development
Energy Devices Development Center
Technology HQ,
TDK Corporation

02 Home

Contributing to a healthy and more convenient lifestyle through revolutionary semiconductor embedded substrate (SESUB) technology

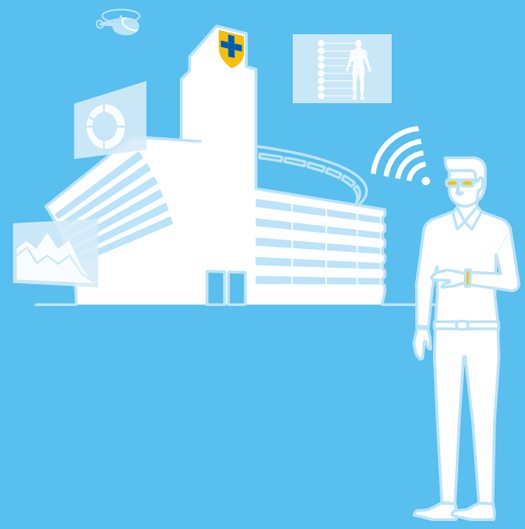
I am involved in developing new businesses for the Taiwanese and Chinese markets, based on TDK's SESUB technology for modular packaging of semiconductors. The key advantage of this technology is the fact that it enables the combination of many functions within a highly compact space. It will be indispensable for the evolution of the IoT, in particular in the area of wearable devices, where it is bound to significantly change the world we live in. Sensors directly integrated in a module are able to pick up a range of information about the human body. By transmitting this information and integrating it for example with smartphones or electrical appliances, our daily life can be made more comfortable and health-oriented. I therefore believe that SESUB has the potential to bring about positive changes in the patterns of human life. As an engineer, I want to be part of such developments and I will work with enthusiasm towards realizing that vision.



Jeff Wu

Development
TDK Taiwan Corporation

03 Health Care



A wide variety of sensors to improve the quality of life

My work involves sensing of various data related to the human body. I aim to contribute to a healthier life by taking advantage of the wide arsenal of TDK's sensor technology to detect information that could not be assessed so far. One example is pathology analysis. There are many possibilities for activities in this field, for example discovering risk factors in a patient's life in order to develop ways to prevent the progress of a disease, or monitoring tremors in limbs to administer medication with optimized timing. If we succeed in developing systems that perform actions automatically in response to sensor data, and if such systems can be turned into viable products, the daily life of humans is bound to change significantly. We want to improve the quality of life through compact and lightweight devices that do not impose a burden on the wearer.

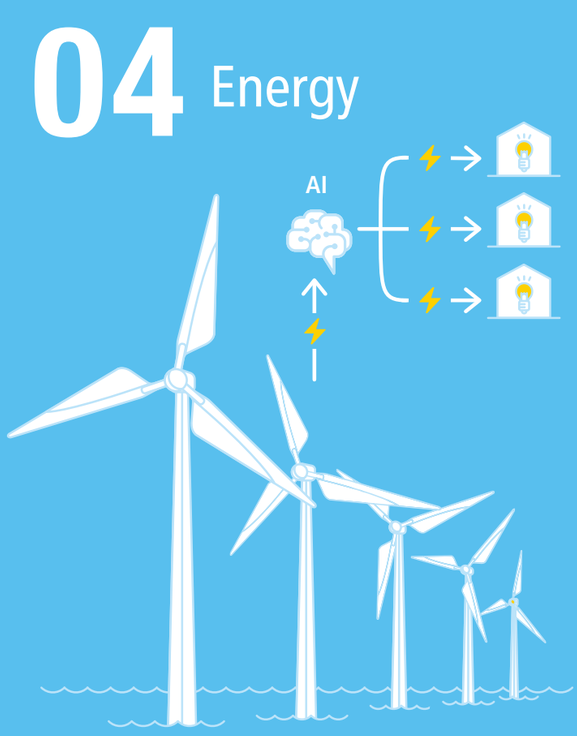
Wenhsiang Wu

Development
IoT Systems Business Unit
New Business Promotion Center
TDK Corporation

04 Energy

Proprietary magnet technology creates new value in the renewable energy field

As the global environment is changing, renewable energy sources are the focus of increasing attention all around the world. Taking the market for wind power generation as an example, realizing higher efficiency is a key goal. To achieve this, systems are getting larger and are being moved from onshore to offshore locations. Neodymium magnets, which are said to have especially strong magnetic power and high heat resistance, are playing an active role here. TDK distinguishes itself from rivals and contributes to increased efficiency through three technologies: magnetic material technology, which runs in TDK's DNA and is our greatest strength; state-of-the-art automation technology to achieve high quality and mass production; and thin-film coating technology. TDK's magnets are opening up a new age. By promoting cross-division collaboration and exploring various technological opportunities, we will continue to devote ourselves to creating new products for the future and supplying our customers with more advanced and more diverse added value.



Philippe Margerte

Sales & Marketing
TDK Europe GmbH

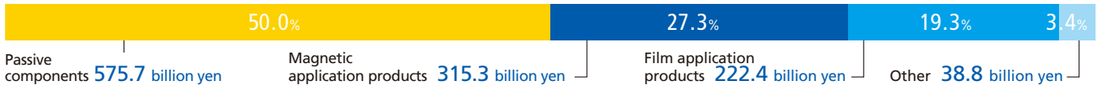
TDK's versatile product lineup

Many different kinds of electronic components and devices sustain electronic society.
TDK's exclusive mastery of core technologies combined with *Monozukuri* power, i.e. the capability to produce outstanding products in a spirit of craftsmanship drives our activities in a wide range of fields.

Net sales by segment

Consolidated net sales 1,152.3 billion yen

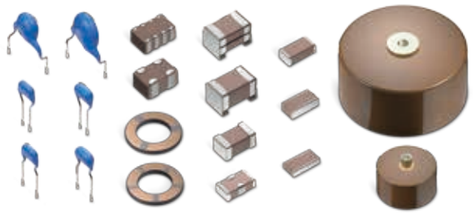
* FY March 2016



Passive Components

Ceramic capacitors

Used for noise suppression and signal processing in a wide range of electronic devices indispensable for daily life. A single smartphone contains more than 400 multilayer ceramic chip capacitors.



Inductive devices

The lineup includes coils of different types including wound, multilayer, and thin-film, as well as transformers and noise countermeasure components. These contribute significantly to fuel economy in cars, higher efficiency in communication systems, as well as higher sensitivity and longer battery life in smartphones.

High frequency components and modules

TDK supplies high frequency components and modules based on advanced know-how such as LTCC technology, thin-film technology, and MEMS technology. Ongoing development of new products in this area contributes to the world's most advanced mobile devices.

* LTCC: Low Temperature Co-fired Ceramic multilayer substrate
MEMS: Micro Electro Mechanical Systems

Piezoelectric material products, circuit protection devices

Piezoelectric actuators and other products utilizing piezoelectric materials contribute to enhanced fuel economy in automotive engines. Other key items in this area are circuit protection devices such as varistors and arrestors.

Aluminum electrolytic capacitors and film capacitors

Aluminum electrolytic capacitors feature high capacitance and come in various types, such as large products for industrial equipment, high-reliability axial lead types for automotive applications, etc. Film capacitors are used in many different applications.

Sensors

The lineup includes current sensors, temperature sensors, pressure sensors, gear tooth sensors, toner sensors, and various other sensors that are essential for realizing multifunction capability in electronic devices, improving the functionality of car electronics, and driving progress in factory automation and office automation.

Magnetic Application Products

Power supplies

Designed mainly for industrial equipment, the lineup includes AC-DC switching power supplies, programmable power supplies, DC-DC converters, and power supplies for charging storage batteries. Automotive power supplies for xEV are also available.

Magnets

In addition to ferrite magnets and neodymium magnets, TDK also offers rare earth free magnets. These contribute to energy and resource conservation and higher efficiency in the automotive sector as well as infrastructure and industrial equipment.

Recording devices

TDK's world-famous magnetic heads contribute to improve recording density in hard disk drives. Various sensors using high-output GMR and TMR elements are also widely used, for example in the auto-focus encoders of single-lens reflex cameras.

Film Application Products

Energy devices

TDK contributes to the storage of electrical energy in many instances, ranging from low-profile batteries in tiny devices such as smartphones to the massive high-capacity batteries of wind and solar power generation systems.

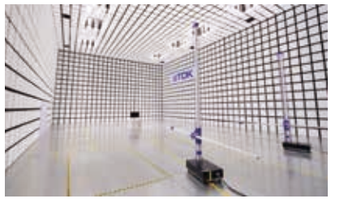
Other

Flash memory applied devices

TDK supplies solid state drives (SSD) with proprietary memory control chips and CompactFlash cards for industrial use. These are found for example in communication base stations and traffic control systems, providing support for the age of big data.

Radio wave anechoic chamber

Radio wave anechoic chambers from TDK have gained an excellent reputation around the world as top-level tools for measurement accuracy, efficiency, and reliability. TDK also offers EMC solutions comprising highly accurate EMC measurement services to support effective noise countermeasures.



Mechatronics (production equipment)

TDK's expertise in mechatronics gained in the production of outstanding electronic components is available in the form of production equipment. We provide load ports for various wafer sizes and flip-chip bonders as well as a range of other advanced factory automation equipment.

For details, please visit "Product Center" of the TDK website. Product Center Search

Five-fold core competence for creating cutting-edge electronic components

Ever since its beginnings rooted in the magnetic material ferrite, TDK has strengthened its base by moving forward, exploring multilayering and thin-film techniques, and now looking toward spintronics for the future. In the quest to further expand the potential of magnetics on the nanometer level, TDK is harnessing the five core technologies outlined here.

Material

The culmination of over 80 years of experience and know-how: "Materials technology"

Advanced materials technology pursues the characteristics of the source material from the atom level on up, to meet highly sophisticated needs. Control of main raw material composition as well as microadditives is an effective approach for achieving specific targeted properties. In over 80 years of operation, TDK has accumulated an enormous wealth of experience and knowledge that leaves competitors far behind.

QCDS (Quality/Cost/Delivery/Service)

"Production technology": Outstanding facilities developed and manufactured in-house

Excellent products can only come from excellent manufacturing facilities. TDK not only develops innovative manufacturing techniques but realizes these by building much of the required equipment in-house. This comprehensive approach is the key to superior *Monozukuri* craftsmanship. We supply services meeting market needs by better quality, lower cost, shorter lead times and promoting integrated production from materials to finished products.

Process

"Process technology" realizes control on the nanometer level

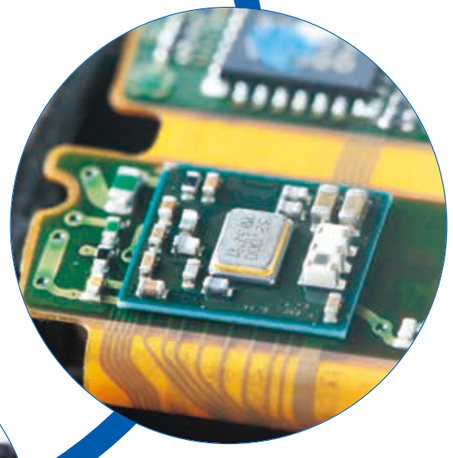
Process technology is the science of getting the best out of the characteristics of the material. Thin-film technology and spintronics are just two examples where manipulation on the order of nanometers is employed to create state-of-the-art electronic components. For example, thin-film technology is applied for the formation of electrodes, coils, and head elements on wafers to produce HDD heads, sensors, actuators, and similar products.

5 Cores

Device & Module

"Device and module technology": Proprietary mounting technology enables to evolve electronic equipment into the future

This technology involves combining various electronic components into high-performance, multi-functional electronic devices and optimized modules. Making use of the revolutionary SESUB process for embedding chips along with other circuit elements and wiring into the substrate itself, the next-generation electronic components are becoming a reality. We also offer energy units that combine power conversion, storage, and energy control functions.



Analysis & Simulation

"Analysis & simulation technology" is applied to accurately analyze ultra-fine aspects of a process.

Even the most advanced materials and process technology would not lead to successful product development without accurate and trustworthy analysis and simulation techniques. Starting from material analysis, TDK evaluation and simulation technology is widely applied to assess structural and thermal aspects, analyze electromagnetic field properties, and perform noise measurement and design noise countermeasures using an anechoic chamber.

What is a nanometer?

A nanometer (nm) is one billionth of a meter. Technology that operates on such a submicroscopic scale is called nanotechnology, a field where TDK plays a pioneering role.

Thickness of a human hair	0.1 mm
Red blood cell	10 µm
DNA	1 nm
Atom	0.1 nm

The global network of the worldwide leader in electronics

TDK is expanding on a global network linking Japan, Asia, Europe, and America, pursuing business operations in more than 30 countries and regions around the world.
Cutting-edge R&D culminating in industry-leading technologies and an optimized production framework enable us to flexibly respond to a wide range of customer needs.

Overseas production ratio **86.3%**

Overseas employees ratio **90.3%**

Overseas sales ratio **92.1%**

China

TDK Hong Kong Co., Ltd. (Hong Kong)
SAE Magnetics (H.K.) Ltd. (Hong Kong)
TDK Dalian Corporation (Dalian)
TDK Xiamen Co., Ltd. (Xiamen)
Qingdao TDK Electronics Co., Ltd. (Qingdao)
TDK (Suzhou) Co., Ltd. (Suzhou)
Amperex Technology Ltd. (Hong Kong)
Wuxi TDK-Lambda Electronics., Ltd. (Wuxi)
Acrathon Precision Technologies (HK) Ltd. (Hong Kong)
TDK Dongguan Technology Co., Ltd. (Dongguan)
Navitasys Technology Limited (Hong Kong)
Guangdong TDK Rising Rare Earth High Technology Material Co., Ltd. (Meizhou)
EPCOS (Zhuhai) Co., Ltd. (Zhuhai)
EPCOS (Zhuhai FTZ) Co., Ltd. (Zhuhai)
EPCOS (Xiaogan) Co., Ltd. (Xiaogan)
EPCOS (Xiamen) Co., Ltd. (Xiamen)

Europe

TDK-Lambda UK Ltd. (UK)
TDK-Lambda Ltd. (Israel)
TDK-Micronas GmbH (Germany)
TDK-Micronas New Technologies GmbH (Germany)
TDK-Micronas Ltd. (UK)
EPCOS AG (Germany)
TDK-EPC AG & Co. KG (Germany)
EPCOS Elektronikai Alkatresz Kft. (Hungary)
EPCOS Electronic Components S.A. (Spain)
EPCOS s.r.o. (Czech)
Becromal S.p.A (Italy)
Becromal Iceland ehf (Iceland)
EPCOS OHG (Austria)
EPCOS Croatia d.o.o. (Croatia)

Other Asia

TDK Taiwan Corporation (Taiwan)
TDK Korea Corporation (Korea)
TDK (Malaysia) Sdn. Bhd. (Malaysia)
TDK (Thailand) Co., Ltd. (Thailand)
TDK Philippines Corporation (Philippines)
TDK-Lambda Malaysia Sdn. Bhd. (Malaysia)
Magnecomp Precision Technology Public Co., Ltd. (Thailand)
Hutchinson Technology Operations (Thailand) Co., Ltd. (Thailand)
Entrocomponent Solution Singapore Pte. Ltd. (Singapore)
EPCOS India Private Ltd. (India)
EPCOS Sdn. Bhd. (Malaysia)
PT. EPCOS Indonesia (Indonesia)

Japan

Akita Prefecture
- Chokai Factory
- Inakura Factory
- Nikaho Factory
- Honjo Factory
- TDK-MCC Corporation
  - Honjo Factory
- TDK Yurihonjo Corporation
  - Ishiwaki Factory
  - Yashima Factory
- TDK Ugo Corporation
  - Ouchi Factory
  - Konoura Factory
  - Iwaki Factory

Iwate prefecture
- TDK-MCC Corporation
  - Kitakami Plant

Yamagata prefecture
- TDK Shonai Corporation
  - Sakata Plant
  - Tsuruoka Plant

Chiba prefecture
- Narita Plant
- Technical Center

Niigata prefecture
- TDK-Lambda Corporation (Nagaoka Technical Center)

Nagano prefecture
- Asama Techno Factory
- TDK Shonai Corporation
  - Iida Plant

Yamanashi prefecture
- Kofu Plant

Shizuoka prefecture
- Shizuoka Plant

Oita prefecture
- Mikumagawa Plant

* TDK-MCC Corporation, TDK Yuri Honjo Corporation, and TDK Ugo Corporation are to be integrated into TDK Akita Corporation on April 1, 2017

Ratio of employees by region

Asia except Japan	78.3%	71,767 persons
Japan	9.7%	8,920 persons
Europe	8.5%	7,763 persons
Americas	3.5%	3,198 persons

Net sales by region

Asia except Japan	70.6%	813.9 billion yen
Europe	12.6%	145.3 billion yen
Americas	8.9%	102.0 billion yen
Japan	7.9%	91.1 billion yen

* FY March 2016

Americas

TDK Ferrites Corporation (U.S.A., Oklahoma)
TDK Components U.S.A., Inc. (U.S.A., Georgia)
TDK RF Solutions Inc. (U.S.A., Texas)
Headway Technologies, Inc. (U.S.A., California)
TDK-Lambda Americas Inc. (U.S.A., California)
Hutchinson Technology Incorporated (U.S.A., Minnesota)
EPCOS do Brasil Ltda. (Brazil)

* Major production and R&D bases, as of December 2016

TDK Corporation

Head Office: Shibaura Renasite Tower, 3-9-1 Shibaura, Minato-ku, Tokyo, 108-0023 Japan
Established: December 7, 1935
Consolidated net sales: 1,152.3 billion yen (Fiscal year ended March 31, 2016)
Consolidated number of employees: 91,648 persons (as of end of March, 2016)

History

1935

1935 Tokyo Denki Kagaku Kogyo K.K. established in Tamura-cho, Shiba-ku (currently Minato-ku), Tokyo City for commercial production of ferrite cores.

1935
The first ferrite cores

1937 Kamata Plant constructed, mass production of ferrite cores begins.
1940 Hirasawa Plant constructed in Hirasawa-cho (currently Nikaho City), Akita prefecture.
1951 Production of ceramic capacitors begins at the Hirasawa Plant.
1953 “Synchro Tape” - magnetic recording tape introduced.
1955 Ulcon Disc capacitor introduced.
1958 “Paramistor” (a parametron arithmetic element using ferrite core) wins the Grand Prix at the Brussels World Exposition.
1959 TDK opens its first overseas office in Los Angeles.
TDK shares listed on the Tokyo over-the-counter market.

1958
“Paramistor” (a parametron arithmetic element using ferrite core)

1960

1960 Yawata Plant constructed in Ichikawa City, Chiba Prefecture.
1961 TDK shares listed on the First Section of the Tokyo Stock Exchange.
1965 TDK establishes a local subsidiary in New York.
1966 “Synchro Cassette Tapes” introduced.
1968 Joint venture company established in Taiwan.
1969 Chikumagawa Plant constructed in Saku City, Nagano Prefecture.
1970 Chokai Plant constructed in Nikaho-machi (currently Nikaho City), Akita Prefecture.
Shizuoka Plant constructed in Sagara-cho (currently Makinohara City), Shizuoka
1972 Winchester Heads developed.
Local subsidiary established in Dusseldorf, Germany.
1978 Headquarters moved to 1-13-1 Nihonbashi, Chuo-ku, Tokyo.
VHS format “Super Avilyn Video Cassettes” introduced.
Narita Plant constructed in Narita City, Chiba Prefecture.

1966
The nation’s first cassette tapes for music introduced

1980

1980 Magnetic heads using amorphous materials introduced.
1982 Mikumagawa Plant constructed in Hita City, Oita Prefecture.
TDK shares listed on the New York Stock Exchange.
1983 Company name changed to TDK Corporation.
TDK serves as an official sponsor of the First IAAF World Championships in Athletics (Helsinki)
1985 TDK has a pavilion at the International Exposition, Tsukuba, Japan.
1986 TDK acquires SAE Magnetics (H.K.) Ltd., a magnetic head maker.
1989 Local subsidiaries established in Malaysia and Luxembourg.

1982
TDK is listed on the New York Stock Exchange

1990 Technical Center completed in Ichikawa City, Chiba Prefecture.
1991 Local subsidiary established in Thailand.
1992 Plant constructed in Dalian, China.
Recordable CD-R compact discs with an organic colorant film introduced.
1994 High-density recording MR heads introduced.
Local subsidiary established in Xiamen, China.
1995 Plant constructed in Hungary.
1997 Mikumagawa Plant acquires ISO 14001 certification.
Plant constructed in the Philippines for magnetic head production.
1998 TDK Malaysia becomes TDK’s first overseas plant to acquire ISO 14001 certification.

1990
Technical Center completed in Chiba

2000

2000 Headway Technologies Inc., an American magnetic head maker, acquired.
2001 Multilayer chip capacitor manufacturing and sales company established in Suzhou, China.
TDK R&D Corporation established as a research and development base in the United States.
2002 System of outside directors and corporate officers introduced.
The Mikumagawa Plant becomes the TDK Group’s first operations base in Japan to achieve zero emissions.
2003 Innoveta Technologies, an American developer of power supplies for use in communications devices, acquired.
2004 TDK becomes the first recording media maker to join the Blu-ray Disc Founders.
2005 TDK acquires Amperex Technology Limited, a manufacturing and sales company of Lithium Polymer Battery in Hong Kong.
TDK acquires Lambda Power Group, power-supply business of Invensys plc.
TDK opens the TDK History Museum in Akita Prefecture.
2006 World’s first bare Blu-ray Disc released.
2007 TDK-brand recording media sales business transferred to US data storage products manufacturer and supplier Imation Corp.
2008 Business merger by takeover bid with German electronic device manufacturer EPCOS.
2009 TDK-EPC Corporation established by corporate separation.
“Development of Ferrite Materials and Their Applications” recognized as IEEE Milestone.
2011 Fundamental environmental plan, TDK Environmental Action 2020, drafted (implemented from April 2011).
2012 Dysprosium-free magnet developed.
2014 Ferrite selected as one of “Top 100 Innovations in Postwar Japan.”
2016 Micronas Semiconductor Holding AG acquired to boost growth in the magnetic sensor business.
Business alliance with Qualcomm formed and the establishment of joint venture company (RF 360 Holdings) agreed.
Acquisition of Hutchinson Technology Inc. (USA), a manufacturer of HDD suspension assemblies.
TDK Museum reopened after extensive renewal.

1994
TDK Xiamen Co., Ltd (China) established

2009
The plaque of IEEE Milestone for Ferrite

2016
TDK Museum reopened after extensive renewal

Information

TDK Museum reopened after extensive renewal!

The original TDK Museum was established in 2005 in commemoration of the 70th anniversary of the company’s founding, with the aim of showcasing the history of TDK with a particular focus on *Monozukuri*. On the occasion of the 80th anniversary, the museum has been completely redesigned and is now open in a new format and with new exhibits.

Opening Hours: 10am to 6pm
Closed on: Mondays (Tuesday if Monday falls on a public holiday), any other days as determined by the administration
* Entry free of charge
Access: Nearest station is JR Nikaho Station on Uetsu Main Line from Akita station Approx. 10 minutes on foot (3 minutes by taxi) from the station

History Zone

Future Zone

Branding

In 2015, TDK celebrated its 80th anniversary and began a new phase of corporate branding activities. An advertising campaign was conducted in 2016, featuring the views of four leading personalities on the topic “To What Extent Can We Imagine the Future?” The principals were Physics Nobel Prize winner Peter Grünberg, health psychologist Kelly McGonigal, media artist Yoichi Ochiai, and jazz pianist Hiromi Uehara.

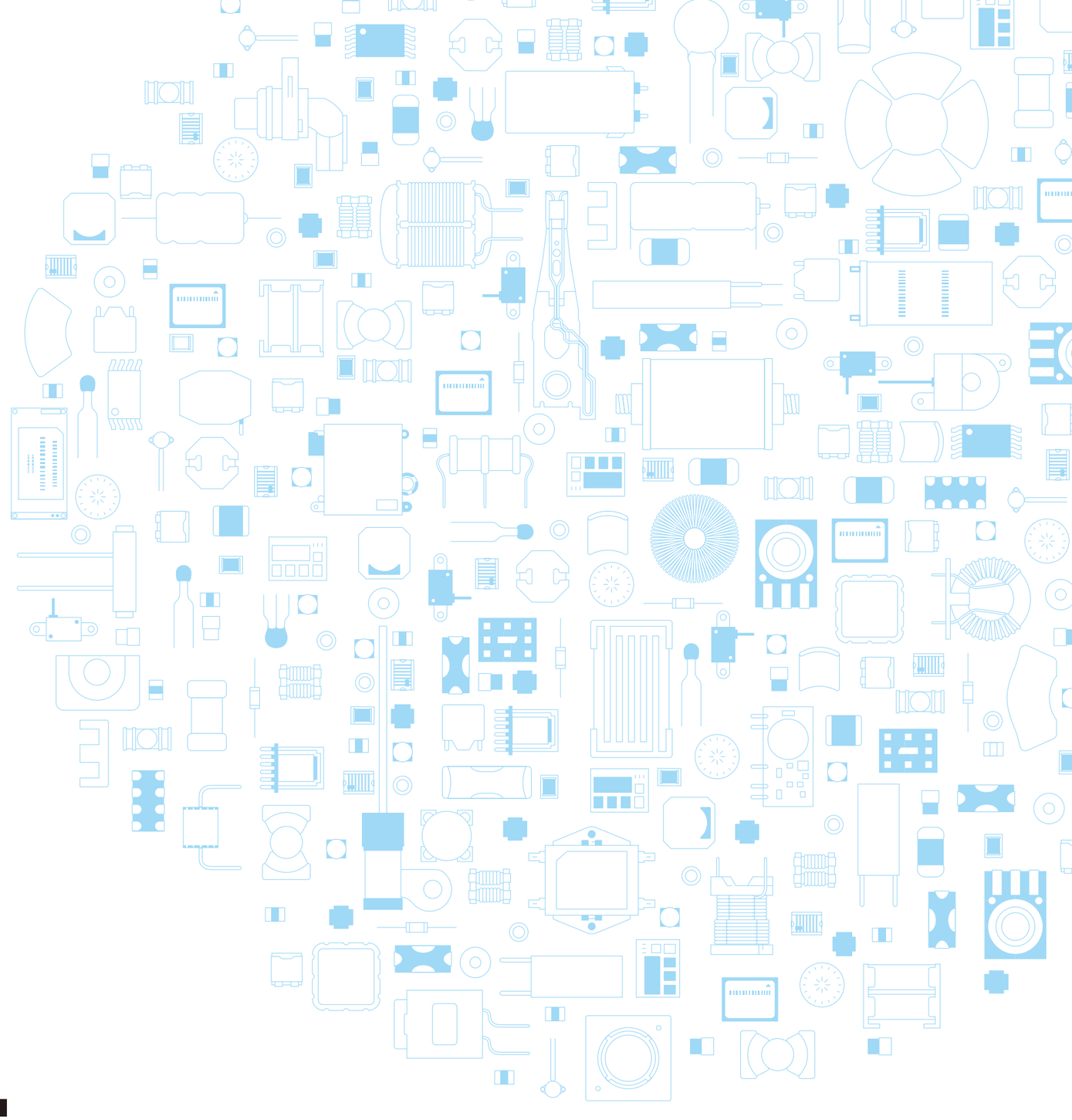
http://www.attractingtomorrow.tdk.co.jp/en/

Recruiting

http:// www.global.tdk.com

New encounters.
New possibilities.

Encounters can lead to passion and excitement. Encounters can lead to affection and friendship. They open the door to new ideas, personal growth, fresh possibilities. The magnetic material ferrite was invented by Dr. Yogoro Kato and Dr. Takeshi Takei. The encounter between these two personalities led to the founding of TDK. The company then went on to new encounters in various sectors including music, computers, automobiles, and energy, always creating new benchmarks for what is possible. Simply waiting for the future to arrive is not enough. Progress does not happen by itself. Bolstered by its strength in magnetics, TDK will continue to actively imagine technologies that make the future happen, creating new standards for next-generation components. TDK makes small products that lead to big things.



Attracting Tomorrow